Stanford

Suggested Elective Courses outside COMM
for Journalism MA Students

Students in the Graduate Program in Journalism are required to take at least five elective courses chosen with the help of their advisors: at least two specialized reporting courses plus three courses either offered by the Department of Communication, or any other Stanford courses to compliment their coursework. The following lists show electives offered in the fields of data/coding/technology, storytelling, and entrepreneurship.

This list is just a sample of suggestions. For a listing of all active courses at Stanford and their schedules for 2016-17, go to Explore Courses:
https://explorecourses.stanford.edu/

---DATA + CODING + TECHNOLOGY suggestions---

CS 106A: Programming Methodology (ENGR 70A)
Introduction to the engineering of computer applications emphasizing modern software engineering principles: object-oriented design, decomposition, encapsulation, abstraction, and testing. Uses the Java programming language. Emphasis is on good programming style and the built-in facilities of the Java language. No prior programming experience required. **(This is one of Stanford's most popular courses.)**

CS 142: Web Applications
Concepts and techniques used in constructing interactive web applications. Browser-side web facilities such as HTML, cascading stylesheets, JavaScript, and the document object model. Server-side technologies such as sessions, templates, relational databases, and object-relational mapping. Issues in web security and application scalability. New models of web application deployment.

CS 145: Introduction to Databases
The course covers database design and the use of database management systems for applications. It includes extensive coverage of the relational model, relational algebra, and SQL. The course includes database design and relational design principles based on dependencies and normal forms. Many additional key database topics from the design and application-building perspective are also covered: indexes, views, transactions, authorization, integrity constraints, triggers, on-line analytical processing (OLAP), JSON, and emerging NoSQL systems. Class time will include guest speakers from industry and additional advanced topics as time and class interest permits.

CS 193A: Android Programming
Introduction to building applications for Android platform. Examines key concepts of Android programming: tool chain, application life-cycle, views, controls, intents, designing mobile UIs, networking, threading, and more. Features ten weekly lectures and a series of small programming projects. Phone not required, but a phone makes the projects more engaging.

CS 193P: iPhone and iPad Application Programming

Tools and APIs required to build applications for the iPhone and iPad platforms using the iOS SDK. User interface design for mobile devices and unique user interactions using multi-touch technologies. Object-oriented design using model-view-controller paradigm, memory management, Swift programming language. Other topics include: object-oriented database API, animation, mobile device power management, multi-threading, networking and performance considerations.

CS 211: Content Creation in Virtual Reality

Students are immersed in a cutting edge virtual reality development environment consisting of both hardware and software elements. Students will progress from configuring a comprehensive development environment to designing and implementing networked content in VR. The deep development focus is overlaid with a discussion series with leaders in the VR space to provide both breadth and depth to a student's understanding of the VR space.

CS 224W: Social and Information Network Analysis

How do diseases spread? Who are the influencers? How can we predict friends and enemies in a social network? How information flows and mutates as it is passed through networks? Behind each of these questions there is an intricate wiring diagram, a network that defines the interactions between the components. And we will never understand these questions unless we understand the networks behind them. The course will cover recent research on the structure and analysis of such large social and information networks and on models and algorithms that abstract their basic properties. Class will explore how to practically analyze large-scale network data and how to reason about it through models for network structure and evolution. Topics include methods for link analysis and network community detection, diffusion and information propagation on the web, virus outbreak detection in networks, and connections with work in the social sciences and economics.

CS 229: Machine Learning (STATS 229)

Topics: statistical pattern recognition, linear and non-linear regression, non-parametric methods, exponential family, GLMs, support vector machines, kernel methods, model/feature selection, learning theory, VC dimension, clustering, density estimation, EM, dimensionality reduction, ICA, PCA, reinforcement learning and adaptive control, Markov decision processes, approximate dynamic programming, and policy search. Prerequisites: linear algebra, and basic probability and statistics. **(This is one of Stanford's most popular courses.)**

CS 246: Mining Massive Data Sets

The course will discuss data mining and machine learning algorithms for analyzing very large amounts of data. The emphasis will be on Map Reduce as a tool for creating parallel algorithms that can process very large amounts of data. Topics include: Frequent itemsets and Association rules, Near Neighbor Search in High Dimensional Data, Locality Sensitive Hashing (LSH), Dimensionality reduction, Recommender Systems, Clustering, Link Analysis, Large-scale machine learning, Data streams, Analysis of Social-network Graphs, and Web Advertising.

CS 377M: HCI Issues in Mixed and Augmented Reality

Mixed Reality (MR) combines physical and virtual worlds together in one unified user experience. With Oculus Rift and Microsoft Hololens releasing in 2016, MR represents the forefront of HCI innovation. In this course, students engage with a range of issues around design and development of MR systems and develop their own MR interactions. The course begins with use, analysis, and redesign of an existing MR system, followed by larger group projects integrating concepts from the course to prototype novel MR interactions. Students work in project teams, prototyping their concept and communicating their progress through demonstration, final report, and presentation.

EE 267: Virtual Reality

OpenGL, real-time rendering, 3D display systems, display optics & electronics, IMUs and sensors, tracking, haptics, rendering pipeline, multimodel human perception and depth perception, stereo rendering, presence. Emphasis is on VR technology. Hands-on programming assignments. Final project: create your own virtual environment. Prerequistites: strong programming skills. Helpful: basic computer graphics / OpenGL.

ENGLISH 184E: Literary Text Mining

This course will train students in applied methods for computationally analyzing texts for humanities research. The skills students will gain will include basic programming for textual analysis, applied statistical evaluation of results and the ability to present these results within a formal research paper or presentation. As an introduction, students in this course will also learn the prerequisite steps of such an analysis including corpus selection and cleaning, metadata collection, and selecting and creating an appropriate visualization for the results.

MCS 100: Mathematics of Sports (STATS 50)

The use of mathematics, statistics, and probability in the analysis of sports performance, sports records, and strategy. Topics include mathematical analysis of the physics of sports and the determinations of optimal strategies. New diagnostic statistics and strategies for each sport.

MS&E 125: Introduction to Applied Statistics

An increasing amount of data is now generated in a variety of disciplines, ranging from finance and economics, to the natural and social sciences. Making use of this information, however, requires both statistical tools and an understanding of how the substantive scientific questions should drive the analysis. In this hands-on course, we learn to explore and analyze real-world datasets. We cover techniques for summarizing and describing data, methods for statistical inference, and principles for effectively communicating results.

MS&E 226: "Small" Data

This course is about understanding "small data": these are datasets that allow interaction, visualization, exploration, and analysis on a local machine. The material provides an introduction to applied data analysis, with an emphasis on providing a conceptual framework for thinking about data from both statistical and machine learning perspectives. Topics will be drawn from the following list, depending on time constraints and class interest: approaches to data analysis: statistics (frequentist, Bayesian) and machine learning; binary classification; regression; bootstrapping; causal inference and experimental design; time series modeling. Class lectures will be supplemented by data-driven problem sets and a project.

MS&E 231: Introduction to Computational Social Science (SOC 278)

With a vast amount of data now collected on our online and offline actions -- from what we buy, to where we travel, to who we interact with -- we have an unprecedented opportunity to study complex social systems. This opportunity, however, comes with scientific, engineering, and ethical challenges. In this hands-on course, we develop ideas from computer science and statistics to address problems in sociology, economics, political science, and beyond. We cover techniques for collecting and parsing data, methods for large-scale machine learning, and principles for effectively communicating results. To see how these techniques are applied in practice, we discuss recent research findings in a variety of areas.

MS&E 334: The Structure of Social Data

This course provides a survey of recent research in the study of social networks and large-scale social and behavioral data. Topics will include network models based on random graphs and their properties; centrality and ranking on graphs; ranking from comparisons; heavy-tailed statistical distributions for social data; the wisdom of crowds; homophily and social influence; experimentation and causal inference on networks.

STATS 204: Sampling

How best to take data and where to sample it. Examples include surveys and sampling from data warehouses. Emphasis is on methods for finite populations. Topics: simple random sampling, stratified sampling, cluster sampling, ratio and regression estimators, two stage sampling.

---STORYTELLING suggestions---

EARTHSYS 235: Podcasting the Anthropocene (EARTHSYS 135)
The Anthropocene refers to the proposed geologic age defined by the global footprint of humankind. It's an acknowledgement of the tremendous influence people and societies exert on Earth systems. Students taking the course will identify a subject expert, workshop story ideas with fellow students and instructors, conduct interviews, iteratively write audio scripts, and learn the skills necessary to produce final audio podcast as their final project. Our expectation is that the final projects will be published on the award-winning Generation Anthropocene podcast, with possible opportunities to cross post in collaboration with external media partners.

ENGLISH 157F: The Experience of Narrative – Serial Storytelling in Print and On TV
"TV's Lost Weekends," a recent headline calls them, referring to our modern habit of binge-watching television shows. Today's commentators debate the right way to watch TV and, as they do, they echo longstanding arguments about how to read books. This course juxtaposes contemporary television with novels from the last 150 years in order to explore different ways of experiencing longform narratives. Primary examples will most likely be Dickens's *Bleak House, The Wire Season 1,* Conrad's *Lord Jim*, and *True Detective Season 1.*

ME 236: Tales to Design Cars By
Students learn to tell personal narratives and make connections between popular and historic media using the automobile. Explores the meaning and impact of personal and preserved car histories. Storytelling techniques serve to make sense of car experiences; replay memories; examine engagement; understand user interviews. This course celebrates car fascination, and leads the student through finding and telling a car story through the REVS photographic archives, ethnographic research, interviews, and diverse individual and collaborative narrative methods-verbal, non-verbal, and film. Methods draw from socio-cognitive psychology, design thinking, and fine art and are applied to car storytelling. Course culminates in a final story presentation and showcase.

---ENTREPRENEURSHIP suggestions---

AFRICAST 142: Challenging the Status Quo: Social Entrepreneurs Advancing Democracy, Development and Justice (INTNLREL 142)
This seminar is part of a broader program on Social Entrepreneurship at CDDRL in partnership with the Haas Center for Public Service. It will use practice to better inform theory. Working with three visiting social entrepreneurs from developing and developed country contexts students will use case studies of successful and failed social change strategies to explore relationships between social entrepreneurship, gender, democracy, development and justice. It interrogates current definitions of democracy and development and explores how they can become more inclusive of marginalized populations. This is a service learning class in which students will learn by working on projects that support the social entrepreneurs' efforts to promote social change.

EARTHSYS 133: Social Entrepreneurship Collaboratory (URBANST 133)
Interdisciplinary student teams create and develop U.S. and international social entrepreneurship initiatives. Proposed initiatives may be new entities, or innovative projects, partnerships, and/or strategies impacting existing organizations and social issues in the U.S. and internationally. Focus is on each team's research and on planning documents to further project development. Project development varies with the quarter and the skill set of each team, but should include: issue and needs identification; market research; design and development of an innovative and feasible solution; and drafting of planning documents. In advanced cases, solicitation of funding and implementation of a pilot project.

ENGR 145: Technology Entrepreneurship
How do you create a successful start-up? What is entrepreneurial leadership in a large firm? What are the differences between an idea and true opportunity? How does an entrepreneur form a team and gather the resources necessary to create a great enterprise? Mentor-guided project focused on developing students' startup

ideas, immersion in nuances of innovation and early stage entrepreneurship, case studies, research on the entrepreneurial process, and the opportunity to network with Silicon Valley's top entrepreneurs and venture capitalists. For undergraduates of all majors who seek to understand the formation and growth of high-impact start-ups in areas such as information, energy, medical and consumer technologies.

GSBGEN 523: Media Entrepreneurship

The disruptive nature of the Internet has set in motion the destruction of business models that have supported traditional media organizations. This course will examine the current state and broader economic challenges facing the media industry. These include: the impact of technology, changing consumer behavior, the rise of mobile, social networks, big data, real-time metrics, innovations in digital advertising and distribution channels, and new business models. Students will analyze new digital media ventures and hear from industry experts facing innovation challenges at the intersection of content, technology and business. The course also will identify paths for entrepreneurs interested in building a media business.

ME 206A: Entrepreneurial Design for Extreme Affordability

Project course jointly offered by School of Engineering and Graduate School of Business. Students apply engineering and business skills to design product prototypes, distribution systems, and business plans for entrepreneurial ventures in developing countries for a specified challenge faced by the world's poor. Topics include user empathy, appropriate technology design, rapid prototype engineering and testing, social technology entrepreneurship, business modeling, and project management. Weekly design reviews; final course presentation. Industry and adviser interaction.

MS&E 273: Technology Venture Formation

Provides the experience of an early-stage entrepreneur seeking initial investment, including: team building, opportunity assessment, customer development, go-to-market strategy, and IP. Teaching team includes serial entrepreneurs and venture capitalists. Student teams validate the business model using R&D plans and financial projections, and define milestones for raising and using venture capital. Final exam is an investment pitch delivered to a panel of top tier VC partners. In addition to lectures, teams interact with mentors and teaching team weekly. Enrollment by application: http://www.stanford.edu/class/msande273

MS&E 476: Entrepreneurship Through the Lens of Venture Capital: Venture Capital From Past to Present

Explores changes in the venture capital industry: rise of Silicon Valley and Sand Hill Road, investing in the dot-com bubble, incubators and accelerators, equity crowd funding platform, and different models of venture capital. Explores how companies are funded, grown, and scale by meeting with individuals who have been at the forefront of this change.

STRAMGT 321: Create a New Venture: From Idea to Launch I

This is an integrated lab course in Entrepreneurship designed to teach students the process of creating a new viable venture - from idea to launch. It is a dynamic and interactive course organized around projects undertaken by teams of 3 to 4 registered students from the MSx and MBA programs, together with other graduate students within Stanford who bring expertise of particular relevance to the idea being pursued. This course is designed not only for students with immediate entrepreneurial aspirations, but also for any student considering starting an entrepreneurial venture at some point in his or her career. The course is a two quarter class, with admission to the class by team and idea. In the winter quarter, teams will research, craft, and morph their idea into a viable business concept. In the spring quarter they will further refine their concept and develop a strategy and plan to attract financial, human and other resources. At the end of the spring quarter, teams will present their plan to a panel of experts and potential investors to simulate the funding process. The new course builds on a predecessor course S356 "Evaluating Entrepreneurial Opportunities" and encapsulates new and important research and findings as they relate to the process of new venture creation. The teaching method is primarily learning by doing (LBD) through a structured process and supported by relevant lectures. Learning is further enhanced through meetings with the instructor, coaching by experienced mentors and review by peers. Field research as well as prototype product development are integral to the course. Since admittance to S321/S322 is by team and the quality of their idea, team formation takes place during the autumn quarter. Informal student mixers and seminars will be held to facilitate team formation and idea generation. Each team of 3-4 students should preferably consist of 1 or more MSx students and graduate students from the MBA program or other Schools

STRAMGT 330: Entrepreneurship and Venture Capital: Partnership for Growth

This 3 unit course is a case study based course designed for those students interested in entrepreneurship and/or investing. The partnership (and interaction) between the entrepreneur and the investor is a very important dimension in the growth of many start-ups. This course examines the entrepreneur and investor relationship from both the entrepreneur's and the investor's perspectives.n nFrom the point of view of the entrepreneur -- we look at how an entrepreneur can select the most suitable investor and match the investor to the growth trajectory of their company. Students will learn how and when to approach investors as well as the positioning of their company to the investment firms' portfolio strategy. Each year we have a range in students' entrepreneurial experience and their enthusiasm. Many students begin the course with a business idea (an original idea for this course or a business idea used in another GSB course). Other students will use a 'borrowed' business idea from a recent start up to test the waters of the entrepreneurial experience. The course gives all levels of entrepreneurs the opportunity to understand the current investing environment in class and in the field. Students have enjoyed connecting with members of the entrepreneur & VC community as they interact with the guest speakers and complete the course projects.n nFrom the point of view of the investor - we look at the rapid evolution of the investor sector; in particular, why entrepreneurs have many more investor alternatives today compared to several years ago. It is important for entrepreneurs (and future investors) to understand investors' motivation and process. We will explain how investors are differentiating their firm in an "entrepreneur's market", look for their next opportunity, their investment selection process and how investors plan to work with the entrepreneur after the investment. nnThe course is geared for multiple audiences: the student who is considering an entrepreneurship or investment career path, the student who 'experimenting' with entrepreneurship for the first time or the entrepreneur who is seriously exploring a start-up idea (and perhaps has already formed a team). Each student audience will benefit from the candid guest speakers discussion as to what happens behind the scenes (e.g. in the investors' partners meeting) and at the negotiating table between the entrepreneur and investor.nnThe course is case study based with engaging class discussions led by your two teachers who collectively have over 70 years of experience as venture capitalists. The course includes frequent guest speakers (both entrepreneurs and investors) who will give alternate and candid off the record details about their experiences. nnClass participation is integral to a successful exchange of ideas; therefore, we encourage class participation and it will count as 50% of your total grade. The other 50% of the grade is based on individual papers, a short presentation to the class, and your individual contribution to a presentation project to an investor panel. Notably, this year's course allows students to choose their role as the entrepreneur, investor or angel adviser for the final presentation to the VC panel (in contrast to previous years' requirement, this year students will be graded for their individual contribution rather than as a team for the final group project).

STRAMGT 353: Entrepreneurship: Formation of New Ventures

This course is offered for students who at some time may want to undertake an entrepreneurial career by pursuing opportunities leading to partial or full ownership and control of a business. The course deals with case situations from the point of view of the entrepreneur/manager rather than the passive investor. Many cases involve visitors, since the premise is that opportunity and action have large idiosyncratic components. Students must assess opportunity and action in light of the perceived capabilities of the individuals and the nature of the environments they face. The course is integrative and will allow students to apply many facets of their business school education.

STRAMGT 354: Entrepreneurship and Venture Capital

Many of America's most successful entrepreneurial companies have been substantially influenced by professionally managed venture capital. This relationship is examined from both the entrepreneur's and the venture capitalist's perspective. From the point of view of the entrepreneur, the course considers how significant business opportunities are identified, planned, and built into real companies; how resources are matched with opportunity; and how, within this framework, entrepreneurs seek capital and other assistance from venture capitalists or other sources. From the point of view of the venture capitalist, the course considers how potential entrepreneurial investments are evaluated, valued, structured, and enhanced; how different venture capital strategies are deployed; and how venture capitalists raise and manage their own funds. The course includes a term-long project where students work in teams (4-5 students per team) to write a business plan (or a business model canvas) for a venture of the team's choosing.

URBANST 132: Concepts and Analytic Skills for the Social Sector

How to create and grow innovative, not-for-profit organizations and for-profit enterprises which have the primary goal of solving social and environmental problems. Topics include organizational mission, strategy, communications/marketing, financing and evaluation. Opportunities and limits of methods from the for-profit

sector to meet social goals. Perspectives from the field of social entrepreneurship. Focus is on integrating theory with practical applications.

URBANST 133: Social Entrepreneurship Collaboratory (EARTHSYS 133)

Interdisciplinary student teams create and develop U.S. and international social entrepreneurship initiatives. Proposed initiatives may be new entities, or innovative projects, partnerships, and/or strategies impacting existing organizations and social issues in the U.S. and internationally. Focus is on each team's research and on planning documents to further project development. Project development varies with the quarter and the skill set of each team, but should include: issue and needs identification; market research; design and development of an innovative and feasible solution; and drafting of planning documents. In advanced cases, solicitation of funding and implementation of a pilot project.

---OTHER suggestions---

ME 377: Design Thinking Studio: Experiences in Innovation and Design

Design Thinking Studio is an immersive introduction to design thinking. You will engage in the real world, with your eyes, with your mind, with your hands, and with classmates to learn, practice, and use the tools and attitudes of design. The fundamental goal of the class is to cultivate the creative, synthetic, and divergent thinking of students. This is a project-based class, asking students to take on new behaviors of work: collaboration, experimentation, empathizing, visualization, craft and inference. Field work and collaboration with teammates are required and critical for student success. Winter 2016: This quarter, we will work on exercising your design muscles, the things designers do everyday (outside of projects or process) that shape their practice. In addition to teamwork, we will practice different core design capacities to stimulate creativity, and make you a better communicator and collaborator. Admission by application. Seedschool.stanford.edu/classesnfor more information.

MS&E 193: Technology and National Security (MS&E 293)

The interaction of technology and national security policy from the perspective of history to implications for the new security imperative, homeland defense. Key technologies in nuclear and biological weapons, military platforms, and intelligence gathering. Policy issues from the point of view of U.S. and other nations. The impact of terrorist threat. Guest lecturers include key participants in the development of technology and/or policy.

MS&E 245G: Finance for Non-MBAs (ECON 135)

The foundations of finance; applications in corporate finance and investment management. Financial decisions made by corporate managers and investors with focus on process valuation. Topics include criteria for investment decisions, valuation of financial assets and liabilities, relationships between risk and return, market efficiency, and the valuation of derivative securities. Corporate financial instruments including debt, equity, and convertible securities.

PUBLPOL 101: Politics and Public Policy

American political institutions (the Presidency, Congress, and the Court) and political processes (the formation of political attitudes and voting) have for some time now been criticized as inadequate to the task of making modern public policy. Against the backdrop of American culture and political history we examine how public policy has been and is being made. We use theories from Political Science and Economics to assess the state of the American system and the policy making process. We use case studies and lectures to analyze contemporary issues including environmental policy, taxes and spending, gun control, economic growth and inequality and mobility. In some of these issue areas we use comparative data from other countries to see how the U.S. is doing relative to other countries.

PUBLPOL 124: What's Wrong with American Government? An Institutional Approach

How politicians, once elected, work together to govern America. The roles of the President, Congress, and Courts in making and enforcing laws. Focus is on the impact of constitutional rules on the incentives of each branch, and on how they influence law.

PUBLPOL 154: Politics and Policy in California

State politics and policy making, including the roles of the legislature, legislative leadership, governor, special interests, campaign finance, advocacy groups, ballot initiatives, state and federal laws, media, and research organizations. Case studies involving budgets, education, pensions, health care, political reform, environmental reforms, water, transportation and more. Evaluation of political actions, both inside and outside of government that can affect outcomes.

PUBLPOL 242: Design Thinking for Public Policy Innovators

What happens when new technology is developed so quickly that society isn't sure if it poses an opportunity or a danger? How should we regulate it when there are real risks but also real potential for societal benefit, both of which are hard to measure? These kinds of dilemmas are arising now in bioengineering, information technology, and beyond. The scientific and policy communities are trying to address these issues, but the clash of cultures between a fast-moving innovation mindset and a risk-averse safety and security mindset affects how this work progresses. In this experimental class, you will explore how design thinking can be used to reinvent a policy ecosystem by focusing on the challenge policymakers face in trying to establish new rules and/or standards that they hope a wide variety of constituent groups will accept and follow and will keep pace with future innovations.

PUBLPOL 308: Political Analysis for Public Policymakers

Policymakers in the United States, whether elected or unelected, operate in a governmental system where politics pervades nearly every element of their daily activity. This course provides students with both the theory and real-world examples they need to understand and evaluate the impact of politics, political institutions, and the political process on policymaking.

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